SURE LEVEL International

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Product Name: High Early Strength Plus Grout (HESP)

Product Description:

High Early Strength Plus Grout (HES) is a high performance, high early strength gain, expanding and shrinkage compensated Class C precision grout.

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High Early Strength Plus Grout (HES) is a high performance, high early strength gain, expanding and shrinkage compensated Class C precision grout. The highly fluid free flowing grout is a blend of Portland cement and graded aggregate and chemical additives. Expansion compensated for shrinkage in both plastic and hardened states. It is suitable for
grouting gap distances 10mm to 100mm in a single application. High Early Strength Plus Grout (HES) is supplied as a ready to use dry powder, requiring only the addition of a controlled amount of clean water to pr duce a free flowing non shrink grout for gap thickness from 10mm to 100mm in a single application.

Recommended Applications:

- Precision grouting, where high early strength gain is required.
- Heavy duty support beneath machine base plates.
- Applications subject to continuous vibrations.
- Bridge bearing and crane rails.
- Critical equipment base plates.
- Precast wall panels, beams and columns.
- Anchoring bolts, bars and fittings.
- Underpinning.

Features & Benefits:

- The expansion systems compensate for settlement & shrinkage during the plastic and hardening state.
- Can be poured or pumped.
- Economical, low in place cost.
- Ready to use, premixed and requires only the addition of water.
- No metallic iron content to cause staining.
- Lower water/cement ratio reduces drying shrinkage and increases durability and reduces permeability.
- Excellent flow characteristics when used in flowing consistency, fills intricate cavities..
- Complete void filling resulting from expansion in the plastic state.
- Rapid early strength gains, facilities for early installation and operation of plant within a matter of hours.

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Performance Properties

Mixing Consistency

The table is a guide to the typical water addition requirements for various consistencies. Litres of water per 20kg bag:

	Flowable	Flowing
Water Table	2.8 – 3.0 Litres	3.2 – 3.6 Litres

Typical Bond Strength

Tested in accordance to ASTM C882

Age	Consistency	Strength
28 days	Flowing	≈ 7.0 MPA

Approximate Setting Times

Vicat setting times at 20°C

	Flowable	Flowing
Initial Set	1/2 Hour	2 Hours
Final Set	2 Hours	21/2 Hours
Initial Expansion	0. 5– 1 %	0.5 – 1 %
Bleeding	0%	0%

YIELDS

The approximate yields are obtained if mixed in accordance with the recommended procedures and accurately measured water content.

	Flowable	Flowing
Approx. Litres per 20kg bag	10.6	10.2
Approx. Fresh Wet Density kg/m3	2200	2250
Approx. Bags required per cubic metre	94	98

Typical Flexural Strength

Tested in accordance to ASTM C348 at 20°C

Age	Flowable	Flowing
28 days	≈ 8.0 MPA	≈ 7.5 MPA

Drying Shrinkage

Tested in accordance to AS1012.13

Time (Days)	Consistency	Shrinkage
56 days	Flowing	<300 Microstrain

Typical Compressive Strength

Tested in accordance with AS1012.9 at 20°C and AS2073

Age	Flowable	Flowing
1 day	≈ 70 MPA	≈ 60 MPA
7 days	≈ 85 MPA	≈ 75 MPA
28 days	≈ 100 MPA	≈ 90 MPA

FLOW CHARACTERISTICS

Tested in accordance to AS2073

Flow (Flowing)	20 - 35 Seconds

Density tested to AS1012.5

Packaging: HES Plus Grout is supplied in a 20kg polylined bag.

Environmental Product Declaration:

A significant component of the cement is made with recycled material that significantly reduces CO2 emissions. It has an Environmental Product Declaration PD®, which is an international standard.

Applications Instructions:

Substrate & Surface Preparation: The substrate surface must be clean, sound and free from oil, grease, curing compound or any loose materials. It must be mechanically abraded back to a sound concrete. Bolts or anchor holes must be clean and free from dust or loose material. This can be achieved by blowing clean the hole.

Pre-Soaking: It is essential to pre-soak the concrete substrate prior to application of GP Grout. Pre-soak the substrates, for a minimum of 1 hour prior to grouting. Immediately before grouting, the excess water should be removed, all water in the anchor and bolt holes must be blown out and no traces of free water should be present whilst grouting.

Base Plate: All traces of rust, oil or grease must be removed. It is essential to provide air pressure relief holes for venting.

Formwork: It is essential that the formwork be constructed to facilitate rapid, continuous and complete filling at area to be grouted. It is essential that the formwork be constructed to be leak proof and water tight. Use methods of forming that will allow grout to flow by gravity, between the base plate and foundation, ensuring grout is kept in full contact with these surfaces until it has hardened.

Unrestrained Surfaces: As GP Grout is an expanding grout, unrestrained areas must be kept to a minimum. It is advisable not to have any unrestrained areas. ensuring grout is kept in full contact with these surfaces until it has hardened.

Low Temperature Working: Normal precautions for winter working with cementitious materials should then be adopted. At temperatures at 5-8°C, the cure rate and strength development rate will be dramatically reduced. If early strength is required, it is advisable to use heated water and warm HES Plus Grout up to 23°C. Do not exceed these temperatures as working time will be reduced.

High Temperature Working: At temperatures above 30°C, it is advisable to use cool water below 20°C when mixing grout. All materials must be kept cool and away from direct sunlight, and area to be section shaded by erecting shade screens. If ambient temperatures are excessive, perform grouting in early morning or late evenings

Mixing: For optimum results, Sure Level HES Plus Grout must be mixed with a mechanical forced action mixer, with a high shear stirrer. It is essential that the grouting operation is continuous, hence ensuring sufficient labour and mixing capacity is available. DO NOT MIX BY HAND!!!!

The selected water content should be accurately measured into a mixing vessel. Slowly, add the total of the Sure Level HES Plus Grout to the water, while mixing. The mixing should continue for a further 3 to 4 minutes, until the grout has reached a uniform smooth consistency. DO NOT ADD ADDITIONAL WATER. Discard any unused grout that has stiffened or hardened.

Placing: It is essential that, at ambient temperatures (approximately 20°C), the grout is placed within 10 minutes of mixing, and this will ensure the expansion process will be maximised and setting is controlled. Flowable Sure Level HES Plus Grout can be placed in thickness ranging from 10mm to 140mm, in one single application. Where thickness is greater than 140mm, special procedures may be necessary, such as the additions ofse-lected aggregate. (Consult the Sure Level office for advice). This may be added at a rate of between 1.0 –5kg per 20kg bag of Sure Level HES Plus Grout with minimal effect on strength.

ADDITION OF GREATER AMOUNTS OF COARSE AGGREGATES WILL PROGRESSIVELY REDUCE STRENGTH UNLESS CONSISTENCY IS ALSO REDUCED.

Avoid trapping air and water, by placing grout from one side only. It is recommended that a suitable head box be used to ensure continuous flow of grout. Ensure entire area to be grouted is filled, by bringing level to above underside of machine base plate and remain at this level throughout grout placement. The grout head must be maintained at all times so that a continuous grout front is achieved. Do not use mechanical vibrators to assist in flow, as this will cause segregation of aggregate. For large areas it is recommended that Sure Level HES Plus Grout be pumped. Sufficient grout must be available prior to starting and the time taken to pour a batch must be regulated to the time taken to prepare the next one.

Curing: On completion of grouting, the exposed area should be covered with wet hessian, plastic sheeting or Sure Level 644 Primer to prevent excessive moisture loss. Keep grout covered for a minimum of 24 hours. Remove formwork, no sooner than 8 hours after completion of grouting and continue to cure with wet hessian, water or Sure Level 644 Primer, which can be used as a curing agent. Lack of sufficient curing could result in plastic cracking and drying shrinkage on surface. The surface should be protected for at least 7 days with either a curing compound (Sure Level 644 Primer) or wet hessian or plastic sheeting.

PRECAUTIONS:

- Sure Level HES Plus Grout generates a moderate degree of heat when curing. More heat is generated at greater thickness or volume. Greater heat will be generated at higher initial temperatures.

- The lower the water content used, the faster the heating and cure rate and the shorter the working time (pot life). Special care should be taken at low water content.

Clean Up: Sure Level HES Plus Grout should be removed from tools and equipment with clean water immediately after use.

Storage: Sure Level HES Plus Grout has a shelf life of approximately 8 months, if kept in a dry environment completely away from moisture.

Health & Safety:

This product is classified as hazardous according to criteria of Work Safe Australia. Material containing Portland Cement and sand now fall into this category. Continuous or extended contact with this product may cause irritation as well as respiratory issues such as bronchitis or silicosis.

- During use avoid inhalation of dust, contact with skin and eyes.
- Suitable protective clothing, dust masks, gloves and eye protection should be worn.
- Continual or extended contact with cement products can cause skin irritation.
- If skin irritation occurs, remove contaminated clothing and flush skin thoroughly with water for a minimum of 15 minutes. Contact Poisons Information Centre or consult medical adviser.
- Safety Data Sheets (SDS) are available on request from the office. Read the SDS and product data sheet carefully before using any product.

Fire: Sure Level HES Plus Grout is

DISCLAIMER Please Note: Recommendation and advice regarding the use of this product is to be taken as a guide only and Sure Level shall not be liable for any inaccuracy in the information or for any loss, injury or damage whatsoever resulting from its use. To the full extent permitted by law, Sure Level liability is limited at its discretion, to the replacement of the goods or the supply of equivalent goods.

Fire: Normal Set 40 is non flammable.

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